

Aerospace Testing Seminar



"Test — Making the Product Better"

Renaissance Los Angeles Airport Hotel

Oct. 27–29, 2015

Abstracts due April 10, 2015

Submit abstracts to:

atstechnicalworkshop@aero.org

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I. ABSTRACT TITLE

SLS Scale Model Acoustic Liftoff Acoustic Environment Test Results and Comparisons

II. ABSTRACT (PLEASE ENTER ABSTRACT OF 200 WORDS OR LESS. ENCLOSE ATTACHMENTS AS NEEDED)

The liftoff phase induces acoustic loading over a broad frequency range for a launch vehicle. These external acoustic environments are then used in the prediction of internal vibration responses of the vehicle and components which result in the qualification levels. Thus, predicting these liftoff acoustic (LOA) environments is critical to the design requirements of any launch vehicle. If there is a significant amount of uncertainty in the predictions or if acoustic mitigation options must be implemented, a subscale acoustic test is a feasible pre-launch test option to verify the LOA environments.

The NASA Space Launch System (SLS) program initiated the Scale Model Acoustic Test (SMAT) to verify the predicted SLS LOA environments and to determine the acoustic reduction with an above deck water sound suppression system. The SMAT was conducted at Marshall Space Flight Center and the test article included a 5% scale SLS vehicle model, tower and Mobile Launcher. Acoustic and pressure data were measured by approximately 250 instruments. The SMAT liftoff acoustic results are presented, findings are discussed and a comparison is shown to the Ares I Scale Model Acoustic Test (ASMAT) results.

III. SESSION (S) (REFER TO THE CALL FOR PAPERS FOR SESSION DESCRIPTIONS & INDICATE THE PRIMARY SESSION THAT MOST IDENTIFIES WITH THE WORK. PRIORITIZE THE SESSIONS, UP TO 3 USING THE FOLLOWING SCALE:

PRIMARY SESSION = 1, SECONDARY SESSION = 2, ALTERNATE SESSION = 3)

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|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> (1) Testing Challenges for Human Space Exploration | <input type="checkbox"/> (5) Strategies and Methodologies |
| <input type="checkbox"/> (2) Test and People Management | <input type="checkbox"/> (6) Innovations in Test Facilities and Equipment |
| <input type="checkbox"/> (3) Test Effectiveness and Standards | <input checked="" type="checkbox"/> (7) Instrumentation, Data Acquisition and Evaluation |
| <input type="checkbox"/> (4) Ground Segment Test | <input checked="" type="checkbox"/> (8) Modeling, Analysis, and Simulation |
| | |

IV. COMMENTS (PLEASE ENTER ANY COMMENTS INCLUDING CO-AUTHORS)

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